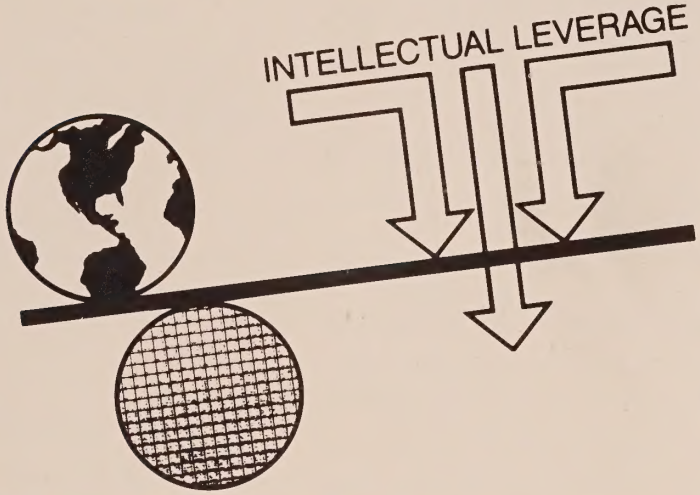
MARCH 3–6

Spring COMPCON 86

THIRTY-FIRST IEEE COMPUTER SOCIETY INTERNATIONAL CONFERENCE
CATHEDRAL HILL HOTEL, SAN FRANCISCO, CALIFORNIA



Compcon Spring 86 will explore the leading-edge developments across the full computer hardware, software, and networks spectrum. The audience will be treated to a broad-based technical update by leading technical experts and developers.

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MARCH 3–6 **Spring COMPCON 86**

THIRTY-FIRST IEEE COMPUTER SOCIETY INTERNATIONAL CONFERENCE
CATHEDRAL HILL HOTEL, SAN FRANCISCO, CALIFORNIA

Providing Technical Perspective
Tutorials: Monday, March 3
Conference: Tues-Thur, March 4-6

YOU can't afford to miss COMPCON Spring '86!

The year's only broad-based computing conference by the world's largest computer society.

READING conference PROCEEDINGS IS NO SUBSTITUTE for hearing and interacting with speakers, audiences and peers!

KEY HOT TOPICS:

• SUPERCOMPUTERS • SDI SOFTWARE RELIABILITY • AI APPLICATIONS • JAPANESE SOFTWARE PRACTICES • RISC VS. CISC

PROGRAM HIGHLIGHTS

(Subject to adjustment)

PLENARY TALKS:
3/4/86 AM

"Current Events in the Application of AI Technologies."
Dr. Thomas P. Kehler, Vice President, Intellicorp.
This exploding technology will be discussed using "real-world" examples describing successes, challenges and impact.

3/6/86 PM

"Japanese and Software—A Good Match?"
Les Belady, Vice President, MCC.
Discussion of experiences while directing a software project in Tokyo including planning, implementation, work ethic and how the U.S. can stay ahead.

SUPERCOMPUTERS:
(Range Maxi's to Mini's). 3/4/86 AM, 3/6/86 AM & PM.

Comparative Review: CRAYs, CYBER 205, ETA Systems, FUJITSU VP Series, NEC SX Series, HITACHI S810 Series, "Trend Projection."

Mainframe Vector Systems: IBM SIERRA 3090, CYBER 180/990, and Japanese entries, Other U.S. Efforts in Supercomputers.

Super-Mini's: Trends, Alternatives, Affordable Systems.

STRATEGIC DEFENSE INITIATIVE:
"Reliability of SDI Software." 3/4/86 PM.

Discussion: Participants include two senior members of the Dept. of Defense SDI Panel and two of the best-known critics of SDI software reliability.

NETWORKS:
(Unified voice & data). 3/4/86 PM, 3/5/86 AM, 3/6/86 AM.

ISDN: Standards, Packets, IC Solutions, Field Trials, Corporate Networking, Terminals, Workstations, Hosts.

PC Net Operating Systems: Distributed, High-performance, Services.

Radio Communications Applied to Nets.

Manufacturing Automation Protocol.

MICROCOMPUTER APPLICATIONS:
3/4/86 PM, 3/5/86 AM & PM.

Typesetting; Optical Publishing; Non-traditional Spread-sheets; Low Cost Computing Applied to Communications Technology; Light Industrial Robotics.

SYSTEM ARCHITECTURES:
3/4/86 AM & PM, 3/5/86 AM & PM.

RISC vs. CISC; RISC Compiler; RISC Addressing for UNIX; Next Generation of Powerful Home Computers; MIPS Micro.; CLIPPER Micro.; CMOS CPU; UNIX Portability; SPECTRUM Family of Computers.

DATA BASE SYSTEMS:
3/5/86 PM, 3/6/86 AM.

CAD/CAM DBMS: Knowledge Base Management, Integrated Manufacturing.

Object Oriented DBMS: Design Evolution and Consistency, Persistent Objects in LISP, DBMS Management, Procedures Extending Rel. DBMS.

Concurrency Control: Distributed for Rel. DBMS, For Queries in Rings, In Distributed Systems with File and Process Migration.

Data Base Machines: Considerations for 1990 Systems, A Design Revisited, DBMS in Local Area Networks.

FIFTH GENERATION ARCHITECTURES AND LANGUAGES:
3/5/86 AM

New Parallel Interface Method; PSI Micro-Interpreter; AQUARIUS; PROLOG Compiler Optimization; PROLOG Object Language; Garbage Collector.

VLSI:
3/6/86 AM & PM

Designing with GaAs Components; Silicon Compilers—A User's Experience; *Testing:* "Real," Bult-in Testing; Simulation Strategies and Fault Models; Automatic Test Generation.

OTHER TOPICS OF INTEREST:
3/4/86 AM, 3/6/86 PM
Copyright and Patent Protection; Accrediting Computer Science Curriculum?

REGISTER NOW AND SAVE MONEY!

FOR FURTHER INFORMATION:
General Chairman, Glen G. Langdon, Jr., IBM Dept. K54/802, 650 Harry Road, San Jose, CA 95120-6099, (408) 927-1818

MARCH 3-6 spring

COMPCON 86

THIRTY-FIRST IEEE COMPUTER SOCIETY INTERNATIONAL CONFERENCE
CATHEDRAL HILL HOTEL, SAN FRANCISCO, CALIFORNIA

TUTORIALS:

3/3/86 ALL DAY

TUTORIAL 1: Silicon Compilation.

Instructor: Daniel D. Gajski, Assoc. Professor, Dept. of Computer Science, Univ. of Illinois. Has been working in industry and academic on super-computer design, silicon compilation and expert systems for VLSI.

Audience: Experience with VLSI design, CAD or silicon compilation is desirable but not essential.

Introduction: CAD vs. silicon compilation. Myths and metamyths. Market taxonomy: silicon houses and foundries.

Silicon Compilation: Definition, methodology, taxonomy. Examples: Genesil, Concord, GDS, MacPitts, Plex.

Theory of Design: Principles and Levels. Translation, style and optimization. Design process. Expert systems.

Processor Compilation: Models, styles, optimizations. Planning. Module compilation: Weinberger array, PLA, RAM, counter, other microarchitectural components.

Cell Compilation: Parametrized cells. Input description. Layout language algorithms. Placement, routing, symbolic layout.

Future Trends: Intelligent silicon compilers.

TUTORIAL 2: Complex Computer Graphics: Illustrated by Drug Design and Genetic Engineering.

Instructor: Robert Langridge, Director of Computer Graphics Laboratory and Professor of Pharmaceutical Chemistry, Biochemistry and Biophysics, UCSF. Experience includes extensive work in computer graphics in molecular biology and in DNA studies, biochemistry, and biophysics.

Audience: Experience/interest in graphics hardware/software is desirable. Interest in molecular biology is not relevant.

Introduction: Graphics for research in complex, three dimensional objects in molecular biology, drug design and genetic engineering. Description of molecules such as proteins and DNA.

One-Way Data Flow: Computer to image flow for "Illustrations." Raster graphics, complex calculation for "realistic" images: Journal figures, frame by frame movies, slides, etc.

Two-way Data Flow: Computer to image to computer with user interaction. "Real-time" molecular structure manipulation with information exchange, realism secondary.

Graphics Technology: Vector and raster hardware. Software. Computation. Interactive elements: menus, dials, joysticks, etc. Cost. Quality. Speed.

Real-time Interactive Manipulations: Molecule and bond rotation. "Dock" drugs into receptors. Illustrative examples on DNA, proteins and drugs using stereo slides, movies and real-time interaction.

Future Prospects: Integrating numeric, symbolic and graphic computation. Application of AI.

TUTORIAL 3: Issues in Expert Systems: An Overview.

Instructor: Henry Sowizral, Computer Scientist, in charge of studies on temporally based computation including knowledge based simulation and distributed expert systems, Schlumberger Research Center, Palo Alto, CA. Previously, at Rand Corporation, he led a project developing an English-like, rule-based programming language called ROSIE.

Audience: Those interested in managing development of, or working on, expert systems. Prior experience is not essential.

Introduction: When are expert systems relevant? Basic concepts of expert systems: Rules, forward chaining, backward chaining, mixed control regimes.

Knowledge Representation: Representational formalism, rules, frames, semantic nets.

Inferencing: Controlling and using prescriptive knowledge, uncertainty, plausible inference, nonmonotonic reasoning.

Knowledge Acquisition and Learning: Obtaining and internalizing descriptive and prescriptive knowledge, necessary underpinnings for building expert systems that learn.

Explanation and Tutoring: Reasoning history, kinds of explanations, the role of prescriptive knowledge.

TUTORIAL 4: Architecture Issues for High Performance Computing and Proposed Solutions.

Instructor: Yale N. Patt, Computer Science faculty member, UCB and SF State. Active in computer architectural research and teaching. Does industrial consulting on high performance machines and is a principal architect of Aquarius, a heterogeneous MIMD high performance system for symbolic and numeric computations.

Audience: Those interested in high performance computer architecture.

Introduction and Focus: High performance numeric and AI computing. Alternative architectures. Influence of problem domain. Influence of technology. Fundamentals of RISC "style." Data flow. Concurrent control flow.

The Issues: Numbers of, and power in, RISC/CISC processing elements. Correct vs. fast arithmetic. Tightly or loosely coupled multiprocessing. Communication topology. Synchronization. Control. Scheduling. Scalability.

Example Machines: Detailed treatment of key concepts of the following designs: Cedar, Ultra, Eli, Cosmic Cube, Non-Von, Connection Machine, BVM, PASM, TRAC, Blue Chip, Aquarius. Ideas embedded in Cray 2 and HEP.

Models of Execution: Analysis of several models of execution including the Berkeley work in restricted data flow.

9:00 Tuesday, March 4

Computer Society Awards

9:30 Plenary Talk

Current Events in the Application of AI Technologies

Dr. Thomas P. Kehler
Executive Vice President, Intellicorp

10:30 - 12:00 Tuesday, March 4

Supercomputers - Maxis to Minis — Sid Fernbach

Today's Supercomputers - K. Stevens: NASA/Ames Research Center
The IBM 3090 Vector Computer System- F. Moore: IBM
The CDC Cyber 180/990 - R. Langley: Control Data Corp.
The High-End Japanese Mainframe Machines P. Zidek: Control Data Corp.
The Superminis Today and Trends for the Future J. Dongarra: Argonne National Lab

Unix Portability — Jim Warren

Portability Under Unix - and the Lack Thereof R. McClure: Unidot

What Do Copyrights and Patents Protect? — Alan Smith

The Expansive Limits of Copyright Protection for Computer Coded or Micro Coded Programs - J. Brown:Brown and Bain
The Copying of Comperable Programs under the Copyright Law - K. Liebman: Irell & Manella
The Scope of Software Copyright: Is "Program Design" Protectable? - S. Katsh: Weil, Gotshal and Manges
Distinguishing Legitimate Reverse Engineering from Chip Piracy Under the Semiconductor Chip Protection Act. R. Stern

1:30 - 3:00 Tuesday, March 4

The HP Spectrum Family — Ted Laliotis

(Titles and authors will be announced later.)

Integrated Services Digital Network — Alan Weissberger

CCITT ISDN Standards - E. Scace: GTE Telnet
ATT Communications ISDN - F. Burg: ATT Bell Labs
IC Solutions for ISDN - P. Westin: Intel Corp.

Low-cost Typesetting with Microcomputers
Robert McClure

PC Pagination Issues - J. Powers: Interactive Features
Digital Fonts for Low-cost Typesetting Systems
J. Collins: Bitstream
Typesetting (Imagesetting?) with PostScript
D. Brotz: Adobe Systems

3:30 - 5:00 Tuesday, March 4

Strategic Defense Initiative: The Software Reliability Issue
Jim Warren

Panel Discussion:
R. Lipton: Princeton Univ., D. Parnas: Univ. of Victoria
G. Nelson: DEC Systems Research Center

ISDN Applications: A Reality Test
Ron Kunzelman

ISDN Field Trials - J. Miller, A. Knapp: Mountain Bell
ISDN Corporate Networking - J. Splear: EDS Corp.
ISDN Terminals, Workstations, and Hosts - R. Amy: IBM Corp.

Knowledge Processing
John Cuadrado

A View of Goal-Oriented Programming - S. Smoliar: USC/ISI
Intelligent Systems for Analog Design - B. Cohen, et al: Octy,
A Knowledge Processing Enviroment in a Logic
Programming System - Lynn Ackler: Westinghouse

8:30 - 10:00 Wednesday, March 5

The MIPS Microprocessor
John Hennessy

A CMOS RISC Processor with Integrated System Functions
J. Moussouris, et al: MIPS Computer Systems
Engineering a RISC Compiler System - F. Chow, et al: MIPS
Operating Systems Support on a RISC
M. DeMoney, et al: MIPS Computer Systems

PC Network Operating Systems
Harvey Freeman

ViaNet: A Distributed Operating Enviroment
B. Johnson: ViaNetix, Inc.
Expanding Capabilities in High-performance Networking
M. Durr: Novell Inc.

USA vs. Japan: Who will win and why
Ed Miller

Your Own Japan Operation for $100,000 - Nothing Down:
J. Gresser: Nutter, McClennen & Fish
The Samurai and the Cowboy: Bushido vs. Macho:
G. Lindamood, Univ. of Maryland

Fifth Generation Architectures
Jim Goodman

Kabu-Wake: A New Parallel Inference Method and its
Evaluation - K. Kumon, et al: Fujitsu Laboratories Ltd.
Evaluation of PSI Micro-interpreter - K. Nakajima, et al, ICOT
Aquarius - Y. Patt, A. Despain: University of California

10:30 - 12:00 Wednesday, March 5

The Clipper Microprocessor
Alan Smith

The Clipper (tm) CAD System - Integrated Hierarchical VLSI
Design - R. Ryan: Fairchild
Clipper Microprocessor Overview - L. Neff: Fairchild
C Compiler Issues on the Clipper - D. Neff: Fairchild

The Next Generation of Powerful Home Computers
Barry Bronson

The Rebirth of Home Computing - T. Hawkins: Electronic Arts
Inside the Amiga Computer - J. Miner: Commodore-Amiga
Design of the Atari 520ST - S. Shizji, L. Tramiel: Atari

Optical Publishing
David Mastandrea

Creating a Research Environment Using Laserdisc Storage
System - A. Mathur: TMS, Inc.
Impact of the Videobook in Electronic Publishing
M. Siegel: Interactive Video Systems
Originating and Finding Data with a Knowledge Retrevial
System - G. Kildall: Activenture Corp.

Fifth Generation Languages
Alvin Despain

MENDEL: Prolog Based Concurrent Object Oriented
Language - S. Honiden, et al: Toshiba Corp.
Garbage Collector with Area-Optimization for the Facom
Alpha - M. Niwa, et al: Fujitsu Limited
A New Optimization Technique for a Prolog Compiler
S. Abe, et al: Hitachi Research Laboratories

1:30 - 3:00 Wednesday, March 5

New Architectures for High-Performance Computer Execution
Yale Patt

ROPE: Ring of Prefetch Elements - A. Nicolau, K. Kartous:
Cornell University
HPS: High Performance Substrate - Y. Patt, UCB
SMAM: Structured Memory Access Machine - E. Davidson,
Univ. of Illinois

REGISTER BY FEBRUARY 14th—AND SAVE MONEY!

CONFERENCE, Tuesday-Thursday, March 4-6, 8:30 AM to 5 PM
Members: ☐ $150 (before 2/14/86) ☐ $180 (after 2/14/86)
Non-Members: ☐ $200 (before 2/14/86) ☐ $230 (after 2/14/86)

TUTORIALS, Monday, March 3, 9 AM to 5 PM
Members: ☐ $150 (before 2/14/86) ☐ $180 (after 2/14/86)
Non-Members: ☐ $200 (before 2/14/86) ☐ $230 (after 2/14/86)

CHECK ONE ONLY

1. ☐ Silicon Compilation
2. ☐ Complex Computer Graphics: Illustrated by Drug Design and Genetic Engineering.
3. ☐ Issues in Expert Systems: Overview
4. ☐ High Performance Computing Architecture

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COMPCON '86 for Special Rate.

Requests for refunds must be received in writing no later than February 21, 1986. Limited tutorial attendance is on a first-paid, first-served basis. Conference registration fee includes one copy of the *Compcon Digest of Papers*, as well as admittance to the conference-hosted party.

*PAYMENT MUST BE POSTMARKED BY FEBRUARY 14 TO QUALIFY FOR ADVANCE REGISTRATION RATES. **Note:** AFTER 2/14/86 ALL RATES INCREASE BY $30.

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DM JAN 86

ON-SITE REGISTRATION will be accepted at the Cathedral Hill Hotel beginning Sunday evening, March 2, 1986.
Payment should be for sum of boxes checked. No purchase orders. Foreign checks must be in U.S. dollars drawn on U.S. bank. Credit card registration is available by phone.

THE INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS, INC.

1:30 - 3:00 Wednesday, March 5 (cont.)

Low-cost Packet Radio Networking — H.S. Magnuski

The Stanford Packet Radio Network
M. Flynn, et al: Stanford Univ.
An Inexpensive Megabit Packet Radio System
R. Bisbey, et al: USC/Information Sciences Institute
Public Domain Packet Radio Networks
H.S. Magnuski: Gamma Technology

CAD/CAM Data Base Management — H. Randall Johnson

Knowledge Base Management for CAD/CAM
H. R. Johnson: Boeing Computer Services
The Architecture and Prototype Implementation of an Integrated Manufacturing Database Administration System - S. Su, H. Lan, et al: University of Florida
Design Evolution and History in an Object-Oriented CAD/CAM DBMS - G. Landis: Mosaic Technologies, Inc.

Light Industrial Robotics — Curt Nehring

An Example Industrial Robotic Application and Interfaces
A. Soghikian: Intelmatec
Flexible Assembly Works: C. Jennings: Adept Technology
The Disposable Robot: G. Wallace: Robotic Systems International
Low-cost Robotic Solutions for Electronics Industry
R. McCleod: Microbot

3:30 - 5:00 Wednesday, March 5

The Great Risc vs. Cisc Debate — Yale Patt

Panel Session:
J. Hennessy, Stanford Univ. — D. Jensen, CMU
E. Davidson, Univ. of Illinois — N. Tredennick, IBM
F. Carruba, Hewlett-Packard Labs

Non-Traditional Applications of the Electronic Spreadsheet — Blake Hannaford

Tba: A. Kay: Apple Computer Corp.
The Electronic Spreadsheet: A Workstation Front-end to Parallel Processors - B. Hannaford, UCB

Object Oriented Database Systems — Mike Stonebraker

Persistent Objects in LISP - M. Butler, Xerox PARC
An Approach to Object-oriented Data Management
N. Derrett: Hewlett Packard Labs
Extending Relational Data Base System with Procedures
M. Stonebraker: University of California

Digital Broadcasting on Radio, Television and Cable — Dennis Waters

Information Services for PCs Broadcast over Cable - G. Bennington: Telecommunications, Inc.

8:30 - 10:00 Thursday, March 6

US Efforts towards Supercomputers — Paul Schneck

Activities of the Federal Coordinating Committee for Science - J. Decker: DOE/Office of Energy Research
DARPA Strategic Computing Initiative - C. Fields: DARPA
The Supercomputing Research Center - P. Schneck, Institute for Defense Analyses

Software Quality Metrics — Norm Schneidewind

Panel Session:
R. Signh, Space and Naval Warfare System Command
N. Schneidewind, Naval Postgraduate School
A. Freund, Allen-Bradley Co.

Data Base Machines — Paula Hawthorn

Design Considerations for 1990 Database Machines - H. Boral: MCC
The Anatomy of the Database Computer, Revisited - P. Neches: Teradata, Inc.
A Database Machine for Local Area Networks - P. Hawthorn, E. Simon: Britton-Lee, Inc.

Designing with Gallium Arsenide Components — Steve Long

Commercializing GaAs LSI: L. Tomasetta - Vitesse
Managing the Multiple Component Problem for Large GaAs Systems - S. Nelson: Cray
Viable Realization Issues and Lessons learned for GaAs Ultra Speed Micro Systems Design: W. Moyer - RCA

10:30 - 12:00 Thursday, March 6

New Computing Alternatives — Creve Maples

The Architecture of the Alliant FX/8 Computer
B. Perron, C. Mundie: Alliant Computer Systems Corp.
Applying Parallel Processing - M. Squires: Sequent Computer

Manufacturing Automation Protocol - Plans, Products, and Applications — Dan Lynch

MAP in the Factory - R. Keil: GM Technical Center
MAP Implementation and Performance Issues
J. Green: Industrial Networking Inc.
Testing and its Role in MAP Realization - K.H. Muralidhar, A. McMillan: Industrial Technology Institute

Concurrency Control — Hamid Pirahesh

Distributed Multi-version Optimistic Concurrency Control for Relational Databases - D. Agrawal, et al: State University of New York
Optimal Processing of Simple Queries in Ring Networks
G. Gursel: San Diego State University
Concurrency Control in a Distributed System and Its Performance for File Migration and Process Migration - A. Hac: John Hopkins University

VLSI Test Capabilities — John Zasio

Real World Built-in Test for VLSI - D. Resnick: ETA Systems
Simulation Studies of Complex Fault Models in Digital Logic
S. Mourad, et al: Stanford University
An Automatic Test Generation System for Large Scale Gate Arrays - P. Aikyo, K. Hatano: Fujistsu MicroElectronics

1:30 - 3:00 Plenary Talk

Japanese and Software - a good match?

Les Belady, Vice President, MCC

3:30 - 5:00 Thursday, March 6

The New Wave of Affordable Super-minis / Mini-supers — Jack Dongarra

The Convex 64 bit Supercomputer System - S. Wallach: Convex
Parallelizing Large Existing Programs - Methodology and Experiences - S. McGrogan: Elxsi

Should Computer Science Curriculum be Accredited? — Thomas Cain

Panel Session:
G. Engel, Univ. of Conn, — Y. Patt, UCB
G. Lawler, UCB, — T. Booth, Univ. of Conn.
E. Lee, Pro-Log Corp., — D. Bjorson, Boeing Corp.

User's Experience with Silicon Compilers — John Murray

Custom IC for Linear Detection
S. Amurthy, J. Southard: High-Tech Seminars
Compiling a Music Signal Processor - D. Rossum: E-MU Systems

Impact of Micro Computer Technology on Navigation — Fred Clegg

A Novel Approach to Automotive Navigation and Map Display
S. Honey, W. Zavoli: Etak Corp.
Microprocessor Impact of Architecture and Performance on GPS User Equipment - C. Ould: Tau Corp.

(Program is subject to change.)

COMPUTER AIDED ENGINEERING

Educational CAE Software Demonstrations on Personal Computers

COMPCON Spring 86 is pleased to offer attendees the opportunity to witness software for Computer Aided Engineering in action! Personal computers will be set up to demonstrate the following systems in a room off the main lobby.

Information Systems Design (Division of Control Data)

Information Systems Design will demonstrate a collection of software packages including schematic entry, SALT, VERILOG, Oceanview, and MicroASPEC and printed circuit board layout that runs on the enhanced IBM AT. The workstation can also be connected to the CYBERNET EXPRESS network to use the total electronic design environment provided by CDC Cybernet services.

VIEWlogic Systems Inc.

VIEWlogic will demonstrate their system to permit a design engineer to design and simulate logic. The system provides multiple window entry and schematic entry, logic and analog simulation, digital and waveform simulation, and a document processor. Thus engineers can report their results by merging schematics and waveforms with the text using the document processor. The system also can interface to a VAX through an Ethernet connection.

HHB Systems

HHB Systems will demonstrate their personal CADAT (Computer aided design and test) logic and fault simulator. CADET runs on the IBM PC AT and permits electronic design engineers to fully simulate or test and debug complex complex logic designs before expensive prototypes are built and manufactured.

Gateway Design Automation Corporation

Gateway Design Automation will demonstrate VERILOG running on an IBM PC AT. VERILOG provides both interactive simulation of digital logic circuits as well as one language at all levels of design description: waveform descriptions, expected responses, and symbolic debugging.

Daisy Systems Corp

Daisy Systems will demonstrate their personal LOGICIAN series workstation running its own software on the IBM PC AT. Personal LOGICIAN provides engineers tools to create, compile, model, simulate, and document their designs. Personal LOGICIAN can operate as a stand-alone workstation or as a part of the Daisy engineering environment.

An Affordable Seminar on COMPUTER AIDED ENGINEERING

Saturday, March 1, 1986, at Stanford University

Cost to pre-registered IEEE members is only $40! **A tutorial and survey for managers, digital design engineers, and the new or prospective CAD tool user that focuses on *CAE system issues* with special attention to *design capture and simulation*.**

Sponsored by the ***IEEE Computer Society***. For further information contact Glen Langdon (408) 927-1818.

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